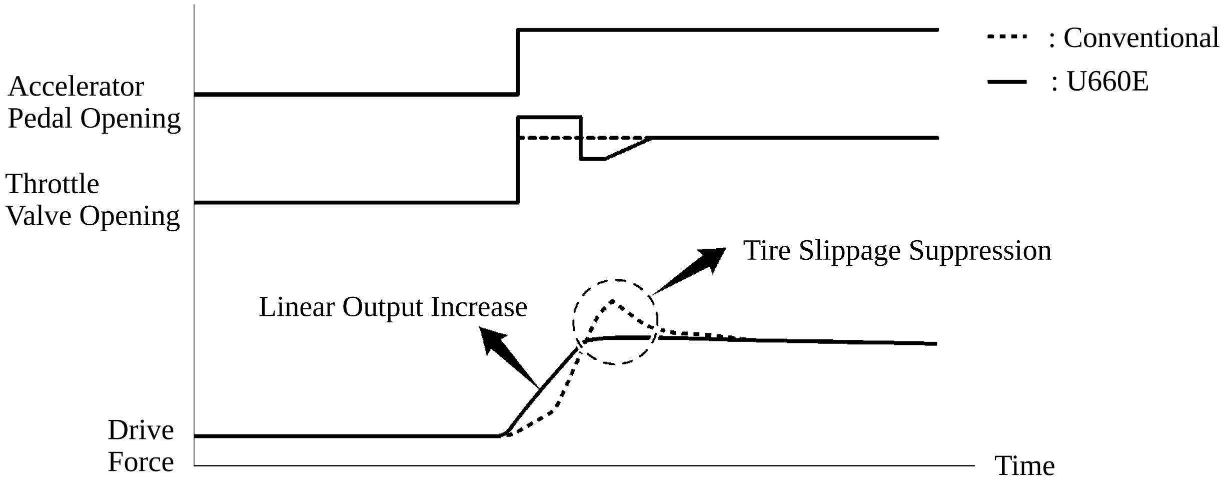
## 7. Powertrain Cooperative Control

### Throttle Control at Launch

By controlling the engine output in cooperative control with ETCS-i (Electronic Throttle Control System-intelligent) when the vehicle is launched, excellent launch performance (improved response and suppression of tire slippage) is ensured.



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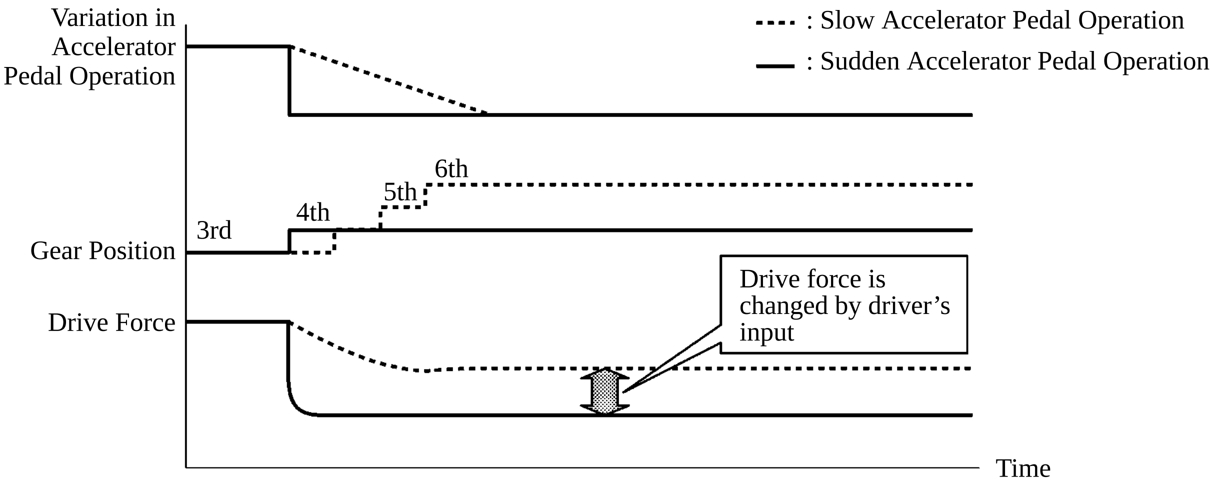
### Deceleration Force Control

The ECT ECU determines the gear position when the accelerator pedal is OFF (released completely) in accordance with the operation of the accelerator pedal (released suddenly or slowly) during deceleration. In this way, preventing unnecessary upshifts and downshifts when the accelerator pedal is OFF and ensuring smooth acceleration when the vehicle needs to accelerate again.



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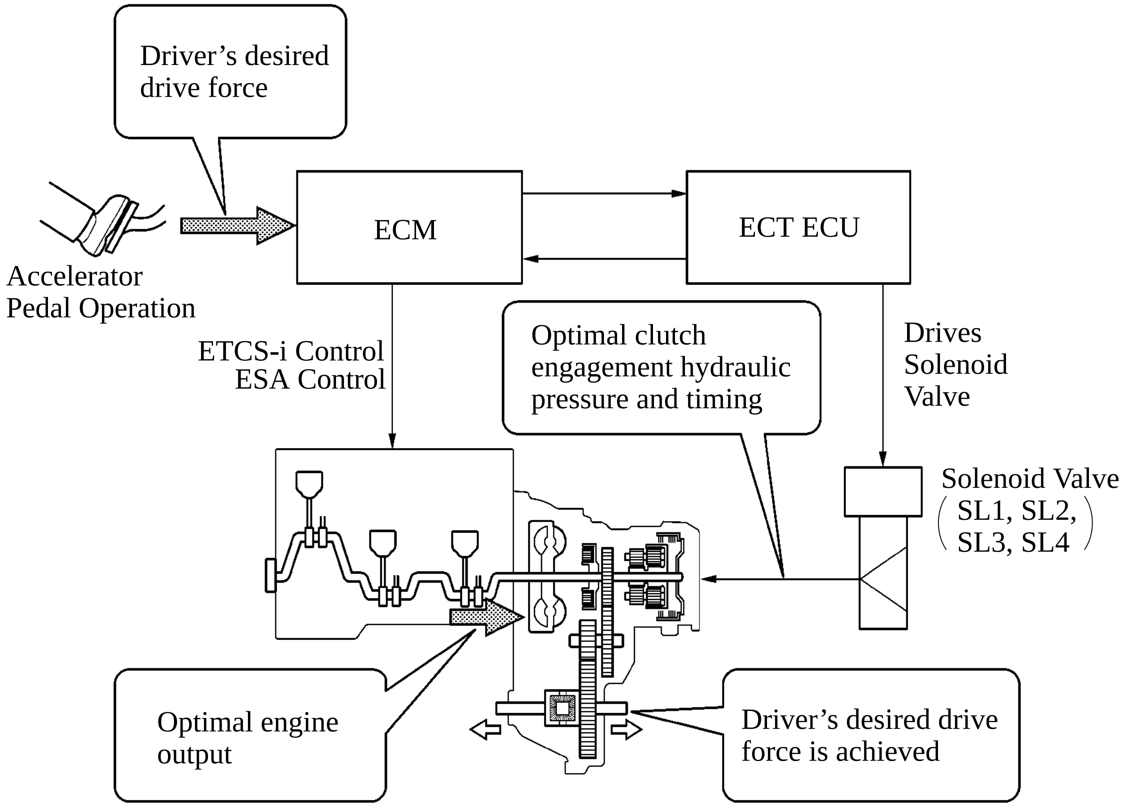
### Transient Shifting Control

Through cooperative control with ETCS-i (Electronic Throttle Control System-intelligent) and ESA (Electronic Spark Advance), and electronic control of the engagement and release speed of the clutch and brake hydraulic pressures, excellent response and shift shock reduction have been achieved.


Driver's desired drive force
ECM
ECT ECU
Accelerator Pedal Operation
ETCS-i Control
ESA Control
Optimal clutch engagement hydraulic pressure and timing
Drives Solenoid Valve
Solenoid Valve (SL1, SL2, SL3, SL4)
Optimal engine output
Driver's desired drive force is achieved

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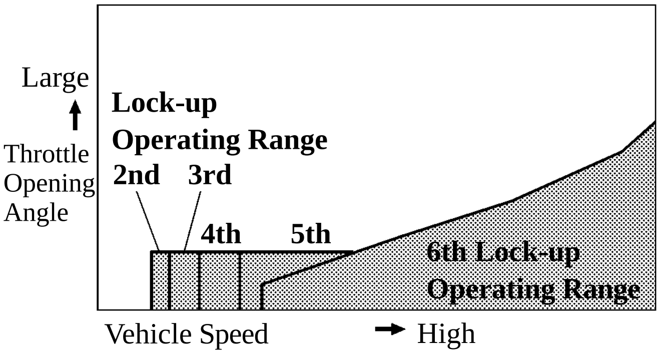
## 8. Lock-up Timing Control

The ECT ECU operates the lock-up timing control in order to improve the fuel consumption while in the 2nd gear or above with the shift lever in the D, S6, S5, S4 range.



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**Lock-up Timing**

**▶ Lock-up Operation ◀**

| Position or Range<br>Gear | D or S6 | S5 | S4 |
|---|---|---|---|
| 1st | X | X | X |
| 2nd | ○ | ○ | ○ |
| 3rd | ○ | ○ | ○ |
| 4th | ○ | ○ | ○ |
| 5th | ○ | ○ | — |
| 6th | ○ | — | — |

○: Operates X: Does not operate —: Not applicable